

LUCI GENETICS BREEDER NOTES

Breeding Guide for "Z Terp" Trait

The "Z terp" is loved by a lot of stoners. Botanically speaking, "Z terp" isn't one terpene. It is a polygenic trait with recessive components that codes for the production of a set of terpenes and flavonoids. In other words, there are a number of genes that have to line up, some of them recessive. Full expression of the "Z terp" requires specific alleles to be homozygous; they have to come from both parents.

Of course, the easiest way to get your "Z terp" into a seed is to reverse a "Z" strain. But this process leads to inbreeding depression and weak selections very quickly. Indeed, many of the "Z" strains are notoriously hard to grow and feeble. This can be mitigated by outcrossing and back crossing, but even doing this repeatedly, especially on previously inbred material, will still result in inbreeding.



There is another way, but it requires time, space, generations, and attention to detail. We illustrate it here with our LuZi breeder seed. We made this F1 specifically for "Z terp" breeding. It has a very cannabinoid-rich (high THC) and hash-oriented pedigree with a pinch of "Z terp" on one side (Hashlife IBL) and a very strong "Z terp" expressing mother (Yellow Zushi). LuZi was made to breed with a homozygous "Z terp" parent like Zkittlez, Rozé, Blue Zushi, Yellow Zushi and find a few "Z terp" hasher selections in the first round, BUT you can start with only LuZi and stabilize a robust, high-cannabinoid "Z terp" strain in about 5 generations.

Of course, you can use this strategy to get "Z terps" onto ANY of your favorite non-Z selections, but we illustrate it with LuZi. Here's a step-by-step guide:

BEFORE YOU START! Get a notebook and be sure to take meticulous notes and label your plants.

Step 1: Understanding the Genetic Background

1. LuZi F1 Genetic Makeup:

- The "Z terp" mother (Yellow Zushi) is homozygous for all alleles required for "Z terp" expression. The $\sim 1/8$ "Z terp" (Hashlife IBL) contributes only a small

proportion of the alleles required for the trait, and these alleles are heterozygous or absent in most F1 individuals. As a result, the F1 LuZi population will have a high level of heterozygosity and reduced potential for immediate "Z terp" expression.

2. Expected Phenotypes in F1:

- The "Z terp" trait will be minimally expressed or not expressed in most individuals due to heterozygosity or absence of required recessive alleles. LuZi **DOES NOT EXPRESS HEAVY "Z TERPS" IN THE F1!**

Step 2: F2 Generation – Creating Genetic Diversity

1. Cross pollinate the F1 LuZi Plants:

- Grow as many F1 plants as possible from the bag of seeds (8 is really the minimum.) Cross-pollinate brothers and sisters of the F1 plants to produce the F2 generation.

2. Phenotypic Expectation in F2:

- Significant variability will appear in the F2 generation due to recombination and segregation of alleles. Only a fraction of individuals will express the "Z terp" trait (maybe 1 in 8), as this requires homozygous recessive alleles at specific loci and favorable combinations of other alleles. Some will be homozygous in all the right places and express the "Z terp," other individuals will carry recessive "Z terp" alleles *without* expressing the trait (carriers), and about half will have broken the set of "Z terp" genes beyond easy retrieval.

Step 3: F2 Selection – Identifying "Z Terp" Candidates

1. Grow a Large F2 Population:

- To increase the chance of recovering homozygous recessive individuals, grow a large number of F2 plants (hundreds, if possible, but 8 will probably give you a selection).

2. Select Based on Phenotype:

- Identify F2 females expressing degrees of the "Z terp" trait. These are likely to have favorable allele combinations, including some homozygous recessive loci. Take clones of these. Choose males based on flavonoids, VST's, and overall look. You don't need clones of these, but definitely curate your F2 seed in case you need to pull a male later.

3. **Pollinate Selected F2 Individuals:**

- Cross-pollinate a few strong males with the 2 most "Z terp" dominant F2 individuals to produce the F3 generation.

Step 4: F3 Generation – Refining the Trait

1. **Grow the F3 Population:**

- Plant the F3 seeds from selfed F2 individuals. Evaluate the expression of the "Z terp" trait in the F3 generation.

2. **Progeny Testing:**

- Identify F2 parents whose F3 offspring show the strongest "Z terp" trait expression. Keep these mothers preserved, if possible, just in case you dead end. Sometimes a backcross with the best F2 will save a doomed F4 line.

3. **Select and Self Best F3 Individuals:**

- Self the F3 individuals with the strongest "Z terp" trait expression to produce the F4 generation.

Step 5: F4 and Beyond – Stabilizing the Trait

1. **Recurrent Selection:**

- Continue selecting and selfing individuals with the strongest "Z terp" expression in each generation. Over generations, recessive alleles will become fixed (homozygous) at the required loci, and the trait will stabilize in the population.

2. **Increase Population Size:**

- Maintain large populations to capture rare recombinants with optimal combinations of alleles.

3. **Backcrossing (Optional):**

- If "Z terp" expression remains weak or inconsistent, consider backcrossing F2 or F3 individuals with the original "Z terp" mother (if still available).
- You might also pull a new male from F2 seed.

Final Goal

- By the F5 or F6 generation, the "Z terp" trait should be stabilizes (fixed) in the population. These are going to be the best seeds, and subsequent selfed generations will

increase inbreeding depression. Plants will consistently express the desired trait due to the fixation of homozygous recessive alleles and optimal combinations of contributing polygenic loci.

Breeding Timeline

- **F2 Generation:** High variability, rare "Z terp" expression.
- **F3 Generation:** Increased frequency of "Z terp" expression in selected lines.
- **F4 and Beyond:** Progressive stabilization and consistent expression of the "Z terp" trait and increased inbreeding depression.

Key Considerations

- **Population Size:** Large populations are critical in selecting the F2 and F3 to capture rare allele combinations. The more, the better.
- **Selection Intensity:** Strong selection pressure should be applied, especially in early generations, to concentrate favorable alleles. Throw away the mids. You don't need them.
- **Timeframe:** Stabilizing a polygenic trait like "Z terp" may take 5–6 generations or longer, depending on the number of loci involved and the initial variability.

This methodical approach will ensure the successful isolation and stabilization of the "Z terp" trait in the LuZi lineage.